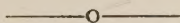


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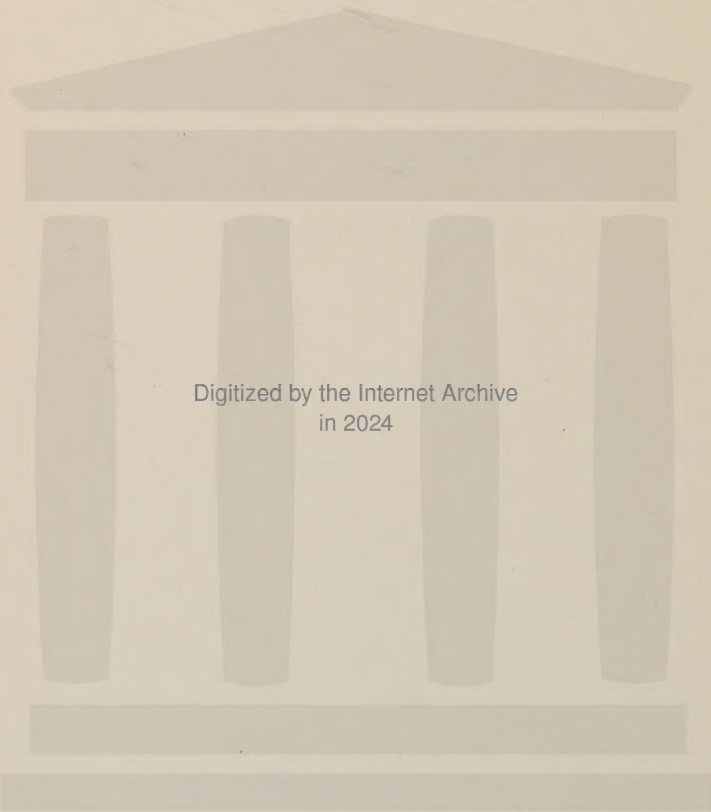
No. 27
NEW MIOCENE FOSSILS

BY

AXEL OLSSON

July 24 , 1916

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U. S. A.
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INTRODUCTION

Since the publication of Bulletin 24 of this series, additional new Miocene species have been discovered and are described in this number. With the exception of two species of *Nassas*, namely *N. shaklefordensis* and *N. alumensis*, the new shells are from the material collected by the two Ecphora trips of 1914 and 1915, and belong to the private collection of Professor G. D. Harris. The two *Nassas* referred to above, are in the Paleontological Museum of Cornell University.

The second Ecphora trip had for its *ultima Thule*, the city of Newbern N. C. on the Neuse river. From there as a base, excursions were made by land by the members of the party to various fossiliferous localities. The interesting, type locality of the upper Miocene or the Duplin Formation, namely Natural Well, was visited by Karl P. Schmidt and the writer. By careful collecting a large amount of good material was obtained and several novelties discovered.

Several notable localities were visited by water and of these, Rock Wharf, on the James river, north of Smithfield Va, deserves mention. This is one of Conrad's original localities from which he described several species in his earlier papers. The beds belong to the Yorktown formation, and have an abundant and well-preserved fauna. Close to 300 species of mollusca are known from this locality.

The last Ecphora trip, as well as the former, was conducted under the personal supervision of Professor G. D. Harris, to whose efforts, the success of the cruise was largely due. For the use and study of the material collected, the writer is indebted to Professor Harris. The willing aid and cooperation received from the other members of the party is also highly appreciated.

*Paleontological Laboratory,
Cornell University,
April 24, 1916*

AXEL OLSSON

Mangilia magnoliana, n. sp.,

Plate 2, Fig. 11

Shell large, slender, with the body-whorl more than one-half the length of the shell; protoconch of about 3 whorls, the 1st smooth, soon followed by curved riblets and later with the addition of 3-4 spirals; post-nuclear whorls 5; the spire-whorls are strongly angulated a little above the middle; riblets 12-14 straight, on the whorls of the spire extending from the lower suture upward and across the shoulder but soon disappearing, the appressed suture being bordered by a broad band free from transverse sculpturing; on the body-whorl, the spirals are fairly regular and finely and closely frosted by transverse lines; aperture with a thin moderately expanded outer lip; canal somewhat bent.

Length 7.5, diameter 1.75 mm.

The frosting of the spirals is fine and requires a lens to be seen. They are easily destroyed by weathering and erosion, but generally some portion of the shell surface will reveal them when examined.

Duplin formation; Natural Well, N. C.

Mangilia emissaria, n. sp.,

Plate 2, Fig. 6

Shell large, with the body-whorl more than one-half the total length of the shell; whorl angulated; nucleus —; post-nuclear whorls 5; suture distinct, not impressed; riblets about 8; on the whorls of the spire, the riblets are strongest below the angulated periphery, weaker above; spirals even, of narrow, flat bands, similar over all and are not frosted; canal long and slender, slightly bent; anal sinus not evident; aperture elongate with a thin outer lip.

Length 10, breadth 3, aperture 4.5, body-whorl 7mm.

Characterized by its large size and few riblets. It appears to be a rare species, the above description being based on a single imperfect specimen.

Yorktown formation; Tar Ferry, N. C.

Mangilia smithfieldensis, n. sp.,

Plate 2, Fig. 12

Shell moderately large and fairly broad; whorls of the spire angulated; nucleus of about 3 unkeeled whorls, the 1st smooth, the 2nd with curved riblets, the 3d in addition with 8 spirals in the interspaces between the riblets; post-nuclear whorls 4, angulated; suture not impressed; riblets 11 or 12, extending from suture to suture, obsolete on the base and on the canal; spiral sculpture of fairly even, wavy, unfrosted spirals; canal straight; anal sinus not evident on any of the specimens examined; mouth broad and fairly long, with a thin outer lip.

Length 8.5, breadth 3.5, aperture 4, body-whorl 5.5 mm.

This species may be known by its unkeeled nucleus, even unfrosted spirals and by the number of its ribs.

Yorktown formation; James river, north of Smithfield Va.

Drillia gastrophila, n. sp.,

Plate 1, Fig. 12

Shell heavy, of fair size with ribs and spirals, but without a pronounced contracted subsutural band; protoconch blunt of nearly $1\frac{1}{2}$ whorls, the first $\frac{1}{2}$ turn smooth, followed by a turn with 3 strong spirals, of which the lowermost appears first; the change from the nuclear to the post-nuclear stage is abrupt; the post-nuclear whorls are about 7, the first with 11 small ribs; the first and the succeeding whorls of the spire have their ribs cut by 2 spiral bands; the last whorl carries 6 spirals which are even above but flatten out and merge with additional spirals below; the suture is bordered by a heavy raised spiral, completely filling the subsutural zone at first, but latter only partially; body whorl with about 13 ribs; anal sinus shallow.

Length 11, breadth 4, body-whorl 6, aperture 4 mm.

The species may be known by its straight sided whorls, its small contracted sutural zone with the strong spiral bordering the suture and by the characteristic sculpturing of its post-nuclear whorls.

Duplin formation; Natural Well, N. C.

Drillia belloides, n. sp.,

Plate I, Fig. 8

Shell pleurotomoid, belonging to the *bella* group but larger and more slender than the typical *bella*; protoconch like that of *bella* but with the ribbed stage much shortened and later with one more spiral; post-nuclear whorls 6; ribs 11-13, typically about 11, not passing from suture to suture; subsutural band well-defined and concave, without ribs and covered at first with low, even spirals which later may become obsolete; the suture in young shells may be bordered by a raised line; the earlier post-nuclear whorls strongly angulated, below with 2 or 3 raised spiral bands; on the later whorls and on the body-whorl, the spirals increase and alternate with smaller ones; ribs on the body-whorl becoming obsolete below; mouth with the outer lip somewhat thickened, and with a shallow anal sinus.

Length 12, breadth 4.5, body-whorl 4.5, aperture 4.5 mm.

This species is distinguished from *D. bella* by its more numerous and less prominent ribs. These ribs do not pass from suture to suture as they do in *bella*. The spirals are likewise heavier and more irregular, size larger, with the sutural zone well-defined.

Yorktown formation; James river, above Smithfield Va.

Drillia ecphoræ, n. sp.,

Plate I, Fig. 3

Shell of a larger size than typical *bella* to which it is related; protoconch blunt, of about 2 whorls, at first smooth, then with ribs and spirals; post-nuclear whorls about 7, with ribs and broad, raised, ribbon-like spirals; body-whorl with 8 ribs which pass well onto the contracted sutural band and also onto the base but do not quite reach the anterior canal; the contracted zone of the early whorls of the spire with 3 very low spirals; below the contracted zone, the ribs are crossed by 3 raised flat-topped spirals which later increase and become impressed; on the body-whorl the sutural band is covered with fine and fairly even spirals, generally about 7 in number; on the body-whorl the spirals are at first even but alternate on the anterior canal;

suture bordered by a thickened band simulating a raised spiral; mouth short, with thickened outer lip and a deep anal notch.

Length 14.5, breadth 5, body-whorl 7, aperture 4.5mm.

This species differs from true *bella* by its larger size and in the differences of its spirals which are low and more ribbon-like, the spirals on *bella* being fine and well-raised. The species agrees with *bella* in having the ribs extending up onto the contracted subsutural zone, differing in this character as well as others from *Drilla belloides*.

Duplin formation; Natural Well, N. C.

***Drillia smithfieldensis*, n. sp.,**

Plate I, Fig. 6

Shell elongate, with relatively small body-whorl and a well-marked though shallow sutural zone; nucleus blunt of about 2 whorls, the first $\frac{1}{2}$ turn smooth, followed by a turn with 4 spirals, of which the 3d from above is the strongest and carinates the whorls; post-nuclear whorls 7, with short smooth-topped ribs and with the spirals in the form of broad flat ribbons; the 1st post-nuclear whorl has the contracted zone well-defined and sculptured with 2 flat spiral bands, below with ribs and 3 spirals; the succeeding whorls show a gradual increase in the number of the spirals but these remain low and do not cross the ribs; body-whorl with 11 or 12 ribs, present only on the middle of the whorl and leaving the base and canal sculptured only by the flat spirals; spirals on the body-whorl about 9, fairly even above but irregular below; the 3d and 4th whorls have the edge of the suture thickened, becoming on the succeeding whorls a wide raised band; mouth small, with a short canal, free from callus.

Length 14.5, breadth 4.5, body-whorl 6.5, aperture 4.5mm.

This species is readily distinguished by its elongate shape and short body-whorl.

Yorktown formation; James river, north of Smithfield Va.

Drillia mcgrawensis, n. sp.,

Plate I, Fig. 13

Shell rather small, slender, sculptured with strong, widely spaced riblets and with strong or obsolete spirals; sutural zone flat and not prominent; nuclear whorls 3, the 1st 2 smooth, the last transversely sculptured by 3 or 4 smooth riblets; post-nuclear whorls 5 or 6, the 1st with the transverse sculpture crossed by 5 or 6 impressed lines, giving rise to spiral bands; on the later whorls, the spirals tend to become obsolete, disappearing entirely from the sutural band and leave the rest of the spire-whorls with 3 or 4 wide spirals, these spirals become obsolete on the body-whorl but a few still persist on the base and on the canal; riblets on the body-whorl about 7, prominent and widely spaced, absent from the appressed, smooth, sutural band and from the base; mouth elongate, but not narrow, with the outer lip thin; columella slightly bent.

Length 8, breadth 3.25mm.

This species belongs with *D. limatula* and *lunulata*. The few heavy, widely-spaced riblets, the inconspicuous sutural band and the presence of spirals on the base are diagnostic.

Duplin formation; Natural Well, N. C.

Drillia magnoliana, n. sp.,

Plate I, Fig's 10, 11

Shell moderate in size, slender, solid, polished and with the whorls only slightly convex; the suture is bordered by a flat band, generally defined by a line or groove; whorls about 9; the body-whorl with about 15 or 16, oblique, straight riblets; these riblets commence just below the periphery and pass upward to the base of the sutural band, here they may become obsolete or continue across in a direction about 135° to their former; as a rule, the riblets on the sutural band are obsolete below, but strong next to the suture; base of the body-whorl without riblets; mouth subovate, with the outer lip thicken-

ed and provided with a fairly deep anal sinus; canal short, straight.

Length 11, 15, breadth 4, 4.5, body-whorl 5.75, 7.5, aperture 4, 4.5 mm.

This species is related to *D. pseudeturnea* of the lower Miocene of Maryland and New Jersey. *D. pseudeturnea* has the riblets continuous over the base and the anterior canal is somewhat longer.

Duplin formation; Natural Well, N. C.

Mitromorpha smithfieldensis, n. sp.,

Plate 2, Fig. 4

Shell small, fusiform, with sharp spirals and few obtuse ribs which are most prominent on the whorls of the spire; nucleus blunt of about $2\frac{1}{2}$ smooth whorls; 3 post-nuclear whorls, each somewhat overhanging the following; the 1st, sculptured with 4 spirals, heaviest below and with a small one bordering the upper suture and separated from the 2nd by a wider interspace than usual; on the succeeding whorls of the spire, a 5th spiral may appear in the lower suture or just above; whorls angulated by the 3th spiral; body-whorl with 14 spirals, the 1st 5 are heavy and sharp, the rest gradually become weaker anteriorly; body-whorl with 8 ribs, present only on the middle; in addition a fine almost microscopic sculpture of incised transverse lines is present, showing best between the spirals; canal short, nearly straight; columella with about 2 obscure folds; outer lip simple.

Length 5.5, breadth 2 mm.

A well-marked species occurring most abundantly on the James river north of Smithfield, its type locality, but also known elsewhere.

Marginella taylori, n. sp.,

Plate 2, Fig. 1

Shell large, subcylindrical, narrow; apex covered entirely by the last whorl but with no apical callus; aperture slightly

longer than the length of the shell, narrow and with the sides nearly parallel below, but curving above towards the apex; outer lip with a heavy varix, thickened near the middle, denticulated within, the denticles strongest anteriorly, fairly regular in the middle, absent from the posterior end; inner lip with a small callus at the posterior end, the remainder without but with 4 strong, subequal plications; these columellar plications are somewhat oblique, with the most posterior one situated at about the anterior third; surface of the shell weathered but probably smooth and polished when fresh.

Length 47. breadth 22 mm.

This species belongs to the group of *Marginellas* containing *M. antiqua* Redf of the Duplin Miocene and *M. wilcoxiana* Dall of the Pliocene. The above shell is much larger than either of these two, *M. antiqua* measures constantly about 31—34 mm, while *wilcoxiana* is much smaller (16 mm). There seems also to be a constant difference between *taylori* and *antiqua* as regards the position of the columella plications, being situated more anteriorly in *taylori*.

Named for Bayard Taylor, a member of the second Ecphora trip.

Yorktown formation; Chocowinity, N. C.

***Marginella schmidtii*, n. sp.,**

Plate 2, Fig. 13

Shell rather small, stout, polished, with an elevated spire and large body-whorl; the body-whorl is widest just above the middle; whorls 4; nucleus blunt; suture indistinct but bordered by a prominent ridge defined by a spiral line below; growth lines quite evident, strongest and somewhat irregular on the area bordering the suture; aperture narrow, somewhat longer than the length of the body-whorl; outer lip with a heavy varix, grooved posteriorly at its attachment to the body-whorl; outer lip denticulated within, the most posteriorly situated denticle large and heavy, the others smaller, subequal or obsolete;

columella with 4 subequal plications, the most posterior ones are nearly flat, straight, the others somewhat oblique; these plications are surrounded by a thin wash of callus.

Length 8, breadth 4, body-whorl 6 mm.

The species may be distinguished from *M. denticulata* by its banded suture and by its peculiar lip.

The species is named for Karl P. Schmidt, a member of the 1st and 2nd Ecphora trips.

Duplin formation; Natural Well, N. C.

Mitra mauryi, n. sp.,

Plate 2, Fig's 14, 15

Shell small, solid, coronate, with a coarse reticulate sculpture of straight ribs and spirals; nucleus large, blunt, smooth; post-nuclear whorls about 4, coronated above by means of a flat or somewhat concave band bordering the slightly appressed suture; the 1st post-nuclear whorl not coronated and with the ribs quite prominent; the succeeding whorls of the spire have below the sutural band 6 nearly equal, raised spirals, separated from each other by wide interspaces, above with only 2 or 3 spirals; the spirals do not noticeably nodulate the ribs and show best on the intercostal interspaces; the body-whorl with 16 spirals below the subsutural band; transverse sculpture of numerous straight ribs numbering on the body-whorl about 34 extending from suture to suture, well over the base and anterior canal; canal nearly straight with 3 strong folds on the columella, the posterior one being the largest; outer lip with 5 or more long, faint plicæ situated a short distance within.

Length 4.5, breadth 2 mm.

This species is very distinct from the other small Miocene Mitras. May be told by the coronated character of the its whorls and strong, persistant sculpture. The species is fairly abundant on the James river, north of Smithfield, Va. A few specimens from Tar Ferry, N. C.,

Named for Dr. Carlotta J. Maury.

Nassa smithiana, n. sp.,

Plate I, Fig. 2

Shell small, solid, elongate, with heavy straight ribs and spiral bands; nuclear whorls 2—3, small, smooth; post-nuclear whorls flattened; ribs heavy and straight, occasionally one is developed which is more prominent than the others and may represent a resting stage; ribs on the body-whorl about 10; spiral sculpture consisting of bands, produced by incised lines cutting both the ribs and the interspaces, these spiral bands, on the body-whorl, number about 11 and are regular and large, except the two uppermost, which are smaller; whorls of the spire with 6 or 7 spiral bands; a deep smooth sulcus cuts into the base of the body-whorl; suture distinct, bordered either by a smooth area or by small spirals; mouth small, rounded or ovate, angulated above; outer lip heavy, denticulate within, columella with a callus, denticulate; siphonal fasciole strong.

Length 14, breadth 6, body-whorl 7 mm.

A very distinctive species, characterized by its elongate shape, heavy ribs and even spiral bands. The species is fairly abundant at Natural Well.

Named for Ernest R. Smith, a member of the 1st and 2nd Ecphora trips.

Duplin formation; Natural Well, N. C.

Nassa gastrophila, n. sp.,

Plate I, Fig. 1

Shell large, with squarish whorls and oblique riblets crossed by few coarse spirals; whorls 5, with slightly convex outlines, angulated above near the suture; body-whorl with 4 oblique, narrow riblets, separated by wide interspaces; riblets extending from the suture onto the base; the body-whorl with 9 raised, subequal, spiral bands crossing both the riblets and interspaces but do not noticeably nodulate the riblets; on the penultimate whorl there are 5 spirals; both the riblets and the spirals are crossed by fine lines which are oblique near the su-

ture, more nearly parallel to the spirals elsewhere; a wide, shallow sulcus encircles the base of the body-whorl; outer lip not heavy, with 6 long, internal lirations; columella smooth, below with a heavy callus, somewhat toothed on the border of the anterior canal.

Length 22, breadth 13 mm.

The coarse spirals and few riblets are the main distinguishing characters of this species.

Yorktown formation; Chocowinity, N. C.

***Nassa alumensis*, n. sp.,**

Plate 2, Fig. 5

Shell small, globose, solid; nucleus of 3 smooth whorls; post-nuclear whorls 3, with few ribs and unequal spirals; the body-whorl with 10 ribs which are most prominent on the middle, obsolete or absent on the base; the ribs are narrow with wide interspaces; spirals consisting of raised, unequal bands, numbering on the body-whorl about 18; on the penultimate whorl, there are 6 spirals, the 1st 2 bordering the suture are low, the next 5 are stronger, the 4th on the periphery, much the heaviest; on the base, the spirals closely spaced and even; basal sulcus with spirals; mouth ovate, angulated above, with the outer lip provided with 6 or 7 denticles within, inner lip smooth or with 1 denticle at its posterior end; siphonal fasciole strong, bordered on the columellar side by a ridge.

Height 6.5, breadth 4, body-whorl 4.25 mm.

A small species, somewhat like *N. bidentata* Emmons, but with different spirals and mouth characters.

Miocene; Alum Bluff, Fla.

***Nassa consensoides*, n. sp.,**

Plate 2, Fig. 10

Shell small, with a large rounded body-whorl and a pointed spire; rather numerous, low, straight ribs, which are crossed by unequal spiral bands; nucleus of 3 pointed whorls, smooth

at first but with a few ribs on the later portion ; post-nuclear whorls 5 ; the body-whorl with 15 straight, low ribs ; spiral sculpture of irregular bands ; 1st post-nuclear whorl with 6 equal spirals ; the other spire-whorls have generally 5 heavy and 6 fine spirals ; the body-whorl with about 21 spirals, strongest on the middle of the whorl ; bordering the suture, there are 6 small, closely crowded spirals ; a small sulcus encircles the base, covered with spirals ; mouth ovate, angulated above ; outer lip thickened and denticulated within ; inner lip callused and with a few denticles below ; siphonal fasciole strong.

Length 11, breadth 6, body-whorl 6 mm.

This species is readily recognized by its large body-whorl, pointed spire, and unequal, spiral bands. In general characters, the species approaches *N. consensa* Ravenel but is sufficiently distinct for recognition and is the Miocene precursor of that species.

Duplin formation; Natural Well, N. C.

***Nassa shackelfordensis*, n. sp.**

Plate 2, Fig. 4

Shell small, coronate, sculptured with straight ribs and few, raised spirals ; nucleus of 3 small, smooth whorls ; post-nuclear whorls 4, shouldered above and with the area bordering the suture with the ends of the ribs, with or without a spiral ; on the spire-whorl there are 3 or 4 narrow, raised spirals which cross both the riblets and the spaces between ; the riblets are somewhat granulated by the spirals ; interspaces between the spirals very wide ; on the body-whorl, there are 3 or 4 additional spirals on the base ; body-whorl with 14 narrow, straight riblets with wide spaces between ; mouth rounded, smooth or faintly lirate within ; canal short, straight.

Length 6, breadth 3 mm.

This species in most of its characters is a diminutive *N. trivittata*. The resemblance is due to the coronate character of the whorl, straight ribs and sharp spirals. Typical *N. trivittata* is not known from our east coast Miocene.

Miocene; Shackelford, Va.

Scala dupliniana, n. sp.,

Plate I, Fig. 14

Shell small, slender ; whorls 3 +, regularly convex and with deep sutures between ; varices about 11, on the body-whorl being low, flat and each provided with a small hook above ; spiral sculpture between the varices of two kinds, a primary set of strong, raised spirals and a secondary intermediate spiral between each two primaries ; on the whorls of the spire, the primary spirals number about 10, smaller more irregular on the base of the body-whorl ; in addition, the space between the primary spirals is sculptured with equal, transverse, raised lines, of the same strength as the secondary, thereby producing a microscopic reticulation ; a narrow band bordering the suture, is without the spiral sculpture ; mouth round, thickened by the last varix.

Length of specimen 5.5 mm (3 whorls)

Breadth 3 mm.

Distinguished by its low flat varices, hooked above, by the spiral sculpture and microscopic reticulation of the spaces between the primary spirals.

Duplin formation ; Natural Well, N. C.

Scala sheldoni, n. sp.,

Plate I, Fig's 9, 15

Shell small, slender, with 3 +, regularly convex whorls ; varices 14, rather heavy, rounded and composed of several, flaring laminæ ; varices alternating in their position on the adjoining whorls ; interspaces smooth or with obscure growth lines ; mouth round, with a heavy outer lip.

Length of broken specimen 5.5 mm.

This well-marked species may be distinguished by its well-rounded whorls and heavy lamellated varices. On the earlier spire-whorls, the varices are somewhat irregular in their outlines and erose.

This neat little species is named for Dr. Pearl Sheldon of

the Department of Geology of Cornell University.

Yorktown formation; Kingsmill, Va, (type locality)
Grove Wharf, Va.

***Scala lineata* Say, var. *magnoliana*, n. var.,**

Plate I, Fig. 5

Shell moderately large, elongate, with 6 + whorls; whorls rounded, with the suture distinct but not deep; varices small and irregular, numbering on the body-whorl about 13; on the base of the last whorl there is an elevated area well-defined by a ridge above; intervarical spaces with irregular spiral bands, generally those situated on the periphery the strongest; mouth rounded with a very thick varix at maturity.

Length 14.5, breadth 6.5 mm.

This shell may prove to be distinct from the recent *S. lineata* Say. The exceedingly heavy lip at maturity is most characteristic.

Duplin formation; Natural Well, N. C.

CERITHIOPSIS Forbes and Hanley

Heterocerithiopsis, n. subg.

Protoconch of — whorls; the last nuclear whorl is strongly angulated in the middle, with a resulting sharp periphery; above the periphery with numerous, curved, smooth riblets, below, with two sets of riblets, which pass obliquely and intersect each other at nearly right angles, thereby producing rows of squarish pits; change to the post-nuclear whorls abrupt.

Type, *Cerithiopsis smithfieldensis*, n. sp.

***Cerithiopsis smithfieldensis*, n. sp.,**

Plate I, Fig. 7

Shell small, elongate-conic, with slightly convex outlines; protoconch of 1 + whorls (the tip broken on my specimens); the last nuclear whorl strongly keeled; above the peripheral keel with 20 curved, oblique riblets, below with oblique riblets

which cross each other at right angles ; later whorls about 7, the 1st 4 with only 2 tuberculated spirals, the remainder with 3 ; the last spiral is introduced above the other 2 and soon equals them in strength ; riblets about 19, straight, extending from the suture across the spirals and their interspaces ; the spirals tuberculated by the riblets ; suture distinct, excavated with a small, smooth spiral within ; base markedly flattened, with 2 smooth spirals, the uppermost commencing at the suture, the 2nd, just below ; the rest of the base is smooth but occasionally an obscure spiral is present encircling the columella ; canal bent to the left.

Length 4.25, breadth 1.50 mm.

May be known by its peculiar nucleus, flattened base of last whorl and globose shape.

Yorktown formation; James river, north of Smithfield, Va.

***Triphoris bartschi*, n. sp.,**

Plate 3, Fig. 7

Shell sinistral, elongate conical, with nearly straight sides ; nucleus of about 2 whorls, smooth at first or somewhat spiraled, on the next turn with 3 strong, smooth, subequal spirals which later decrease to 2 by the disappearance of the lowermost one ; 9 post-nuclear whorls, with 3 or on the earlier whorls only 2 equal, moderately tuberculated spirals ; riblets continuous across the whorl but not onto the base ; the riblets, on the last whorl, number about 21 ; suture well-marked, with a fine smooth spiral ; base flattened, and with 3 (and an indication of a 4th) low, close, smooth spiral ; columella short, truncate and slightly bent both to the right and backwards ; canal open ; mouth large, with the outer lip thin, oblique, expanded below ; anal sinus not evident.

Length 7.5, breadth 1.75 mm.

The spirally sculptured nucleus without riblets, in having the uppermost spiral of the later whorls the weakest and last to appear, will separate this species from its Miocene allies.

Named for Dr. Paul Bartsch of the United States Nation-

al Museum.

Duplin formation; Natural Well, N. C. (type locality)

Yorktown formation; James river, above Smithfield, Va.

***Triphoris dupliniana*, n. sp.,**

Plate 3, Fig. 8

Shell sinistral, elongate-conic, with nearly straight sides ; nuclear whorls 1 +, the last turn with transverse ribbing and 2 peripheral carinæ ; post-nuclear whorls 11, suture indistinct ; the 1st 5 whorls, with 2 subequal spirals, on the 6th whorl, an intermediate spiral makes its appearance and increases gradually in strength ; on the body-whorl, the uppermost spiral is the strongest ; spirals tuberculated by 22 riblets which moreover extend somewhat diminished across the interspiral spaces ; base sloping, with 3 smooth spirals ; columella smooth ; anterior canal moderately long, closed or nearly so and bent both to the right and backwards ; mouth small, rounded ; outer lip oblique, with a deep anal notch bordering the suture.

Length 5.75, breadth 1.75 mm.

This species belongs to the group of *Triphoris*, such as *T. melanura*, which have only 2 spirals on the earlier post-nuclear whorls, later 3, with the last spiral coming in between the other 2. The open, anal sinus and bent, tubular anterior canal are the main diagnostic characters of this species.

Duplin formation; Natural Well, N. C.

Yorktown formation; James river, north of Smithfield, Va.

***Circulus schmidtii*, n. sp.,**

Plate 3, Fig. 16

Shell small, depressed, with the whorls flattened above and below, and with 2 carinæ bordering the upper and lower surfaces of the shell ; whorls about 4, the 1st $2\frac{1}{2}$ turns are smooth and forms a small pointed spire distinctly elevated above the later flattened whorls ; the remaining whorls with raised spirals which commence coarse and alternating but soon become fine and regular ; base with a deep, wide umbilicus, showing the whorls

well up to the apex ; the base is more strongly spirally sculptured than the upper surface ; the basal spirals are irregular and minutely decussated by the growth lines ; whorls strongly carinated just above and below the periphery, and with the intermediate surface strongly sculptured with fine spirals similar to those found on the upper surface ; mouth oblique, rounded.

Greater diameter 1.75, height .75 mm.

Is readily determined by its possessing only 2 carinae and by its flattened upper and lower surface.

Duplin formation ; Natural Well, N. C.

Calliostoma harrisianum, n. sp.,

Plate 2, Fig. 7

Shell of usual size, conic, with straight-sided whorls, and a narrow grooved periphery ; base flattened or only slightly convex ; whorls 5, separated by deep, excavated sutures ; upper surface of whorls with 2 heavy, raised spirals, one bordering the suture, the other at the periphery ; the space between these 2 primary spirals, carries 3 additional, smaller spirals ; the spirals may be granulated or smooth, and the peripheral carina is frequently double ; base flattened, imperforate, and strongly sculptured with 6 or 7 smoothish spirals which are wider than their interspaces ; mouth subovate, oblique.

Greater diameter 7.5, height 6.5 mm.

A well-marked species known at present only from Kingmills. Related to *C. virginicum*.

Yorktown formation ; Kingmills, Va.

Calliostoma suffolkense, n. sp.,

Plate 2, Fig's 8, 9

Shell moderate in size, depressed, with flat upper whorls, a conic spire and angulated periphery ; base flattened, with a narrow steep-sided umbilicus which is smooth within ; just above the periphery, a carina is present which is posterior to the suture on the later whorls of the spire, lacking from the earlier ; whorls

5, the 1st small and smooth, the 2nd and 3d with from 3-5 strong spirals; on the later whorls, the sculpture consists of fine, even, raised spirals, covering the entire upper surface and the peripheral carina; suture distinct, bordered posteriorly by the peripheral carina, anteriorly by a narrow, flat space which is defined by a 2nd lower carina; base flattened, or only slightly convex, covered with fine spirals becoming coarser around the umbilicus; mouth subovate.

Greater diameter 10, height 8 mm.

This is a local species, known at present only from Suffolk. The carina just above the periphery, the fine, even spirals and the open umbilicus are the distinctive characters.

Yorktown formation; Suffolk, Va.

Calliostoma (Eutrochus) shackelfordensis,

Plate 2, Fig. 3

Shell of moderate size, depressed, with flat upper whorls, a conic spire and flattened base; periphery with 2 prominent carinae, grooved between; umbilicus small; whorls about 5, the 1st probably smooth, the 2nd and 3d with 3, 4 or 5 raised, subequal spirals; on the later whorls, the spirals become low and irregular, and assume the appearance of impressed lines; on the 4th whorl, these spiral lines are crowded close to the suture and to the periphery, and with a smooth area between; on the last whorl, the whole space is covered with fine, even spirals; suture deep, excavated, the whorls coiling on the lower carina; the suture is bordered in front by a raised line which is either smooth or beaded; on the last whorl, this sutural line is made up of 3 spirals, similar to those covering the rest of the surface of the whorls; base flattened with impressed spirals, small and regular on the area bordering the periphery, few, coarse and groove-like around the umbilicus; mouth subovate.

Greater diameter 9, height 7 mm.

This species may be compared with *C. cyclos* Dall which it resembles in shape and general characters but differs from that species in its manner of coiling. In *C. cyclos*, the sutures are

closely appressed, the coiling being along the upper carina. In *C. shacklefordensis*, the coiling is along the lower carina, thereby producing a deep, excavated suture.

Miocene ; Shackleford, Va.

***Teinostoma miocenica*, n. sp.,**

Plate 3, Fig's 14, 15

Shell small, solid, porcellanous ; whorls $3\frac{1}{2}$, increasing rapidly in size, through their close coiling ; suture appressed, often indistinct ; nucleus of about 2 smooth whorls separated by a fairly deep suture ; post-nuclear whorls with fine but even spirals which are strongest on the area bordering the suture and on the base ; umbilical area covered with a thin callus, over which the spirals pass, and by a heavy thickening of the columellar wall ; mouth nearly round, oblique, with a thin, outer lip.

Greater diameter 2.25, lesser diameter 1.5, height 1.5 mm.

This species may be known by its covered umbilicus, close coiling and spirally sculptured surface. *T. opsitelotus* Dall, is similiar in its method of coiling but is only obsoletely striated and with an open umbilicus.

Duplin formation; Natural Well, N. C.

***Teinostoma thompsoni*, n. sp.,**

Plate 3, Fig's 3, 4

Shell very small, depressed, porcellanous, polished : whorls about 3, the earlier, covered to a variable extent by the closely appressed suture of the body-whorl ; upper surface smooth, with indistinct growth lines ; the periphery when viewed from above, shows fairly even radial groovings ; base flattened ; umbilicus covered ; the basal surface strongly sculptured by radial grooves and growth lines ; mouth oblique, subovate.

Greater diameter 1.5, lesser diameter 1.00, height .75 mm.

This species is related to *T. nanum* Lea, a common and widespread Miocene shell. It differs from that species in its smaller size, more depressed shape, strongly sculptured base and

periphery.

Named for J. D. Thompson a member of the 2nd Ecphora trip.

Duplin formation ; Natural Well, N. C.

***Pseudorotella bushi*, n. sp.,**

Plate 3, Fig's 5, 6

Shell small, much depressed, polished, porcellanous ; whorls 3, enlarging uniformly ; suture 1st deep and distinct, later becoming appressed and bordered with an impressed band ; surface smooth and shining, with irregular growth lines and generally with fairly regular groovings on the periphery, which may extend well up onto the upper surface ; base flattened, with the body-whorl large, and through the spreading of its columellar wall closing the umbilicus or leaving a small perforation ; the umbilical region is outlined by a small ridge or spiral ; base strongly sculptured by close-set growth lines and with fairly even radial grooves, extending over the base and onto the periphery ; mouth round, oblique.

Greater diameter 1.60, lesser diameter 1.20, height 6 mm.

I am referring to the genus *Pseudorotella* Fischer, the Miocene species described as *Teinostoma calvertense* Martin and *T. vortex* Dall. *T. vortex* is a larger species and perfectly smooth except for the incremental growth lines. *T. calvertense* of the lower Miocene is more closely allied to *bushi*, but our shell may be distinguished by the radially grooved periphery and more strongly sculptured base.

This species is named for Dr. Katherine Bush for her work on the smaller gasteropods of the recent Atlantic fauna.

Duplin formation ; Natural Well, N. C.

***Ethalia alexanderi*, n. sp.,**

Plate 3, Fig's 11, 12, 13.

Shell small, solid, porcellanous ; spire low and rounded ; whorls 3, the 1st turn small, the others much larger ; suture distinct between the later whorls, indistinct between the earlier,

generally with an impressed area in front ; surface smooth, polished with fine incremental growth lines ; mouth round, with a heavy callused columella, behind which is a small umbilical chink ; the umbilicus is faintly outlined by a small spiral line.

Greater diameter 2.25, height 1.50 mm.

This species is related to the recent shells, placed by Dall in the genus *Ethalia*, namely *reclusa*, *suppressa* and *solida*, all of Dall, and in order to associate the Miocene species with those shells, I am referring it to the genus *Ethalia* rather than to *Teinostoma*. These two genera have long been incorrectly used judging from their respective types.

Named for C. P. Alexander of the 2nd Ecphora trip.

Duplin formation ; Natural Well, N. C.

Yorktown formation ; James river, north of Smithfield, Va.

***Molleria harrisi*, n. sp.,**

Plate 3, Fig's 18, 19

Shell very small, solid, naticoid in shape with a very small spire and rounded whorls ; whorls 2-3 with a moderately large nucleus ; whorls solid, rounded, smooth above, with a well-marked suture ; the early whorls are always smooth and generally show but little weathering, the last frequently chalky and eroded ; base with a narrow, deep umbilicus, angulated above and with 2, 3 or more spirals, mostly widely spaced above, closer below, descending spirally into the umbilicus ; umbilicus bordered by 15-20, radially incised lines, extending but a short distance out over the base from the umbilical angle ; last whorl rapidly descending ; mouth rounded, angulated at its attachment to the preceding whorl, internally with a well-marked operculate shelf.

Greater diameter 1.00, height 1.00 mm.

This appears to be a common and wide-spread species in the upper Miocene. *M. harrisi* and the following species, may be separated from *M. minuscula* of the lower Miocene by their sculptured bases. *M. harrisi* has in addition to the spirals which may be either strong or weak, the constant presence of short radially

incised lines. This last named character will separate it from *M. smithfieldensis*.

This interesting little shell is named for Professor G. D. Harris of the Department of Paleontology of Cornell University.

Duplin formation; Natural Well, N. C.

Yorktown formation; Tar Ferry, N. C.

James river, north of Smithfield, Va.

***Molleria smithfieldensis*, n. sp.,**

Plate 3, Fig. 17

Shell very small, naticoid; spire prominent and elevated; suture distinct and deep; whorls about 3, solid, rounded and smooth above with spirals on the base; last whorl somewhat descending; upper surface smooth, with indistinct lines of growth; base with a deep umbilicus, not angulated above and with strong spirals, the 1st 3 (in and around the umbilicus) equal and separated by relatively wide interspaces, the others alternate in strength and rapidly become obsolete and disappear towards the periphery; the 1st spiral is within the umbilicus. the 2nd and 3d, may be considered as outside; the specimen shows 4 other alternating spirals and a few, very obscure ones nearer the periphery; mouth rounded, somewhat angulated above and only slightly attached, internally showing the operculate shelf.

Greater diameter 1.00, height .75 mm.

A series of specimens show some variation in the strength and persistence of the basal spirals. Usually, they are as described above, but occasionally the spirals may continue onto the periphery and also on the upper surface. The species lacks the radial, incised, basal lines of *M. harrisi*.

Yorktown formation: James river, north of Smithfield, Va.

***Cyclostremella magnoliana*, n. sp.,**

Plate 3, Fig's 9, 10

Shell minute, consisting of about two whorls, planorboid in their coiling and enlarging but slowly; suture deep and distinct; upper surface smooth, glossy, with very indistinct, radi-

al depressions parallel to the growth lines; base with a wide, funnel-shaped umbilicus, bordered by two, fairly strong, raised spirals, with fainter spirals nearer the periphery; aperture nearly quadrangular, markedly expanded and flattened below, above angulated near the parietal wall.

Greatest diameter 1.5, height .7 mm.

The species here described, agrees in its fundamental characters with *C. humilis* Bush, a recent Hatteras shell, and type of the genus *Cyclostremella* Bush. The most obvious differences to be noted in the Miocene shell are its smooth, upper surface and more strongly striated base.

Duplin formation; Natural Well, N. C.

Psammobia gubernatoria Glenn, var. *dalli*, n. var.,

Plate 2, Fig. 2

In the Miocene at Chocowinity, N., C. a form of *Psammobia* occurs quite plentifully but rarely in perfect condition. These shells are close to the Maryland *Psammobia* described by Glenn as *gubernatoria*. They differ in a few characters, which on future reseach may prove constant enough for their specific separation. I have a fragment of a large *Psammobia* from Kingsmill Va, evidently the same as the North Carolina shell, thus indicating a fairly extensive range during Yorktown times.

The North Carolina shell is larger and porportionally longer, and with the beaks more centrally located; the surface is smooth, with incremental growth lines which are deeper and irregular on the posterior slope; a small callus is frequently developed just in back of the beaks.

Length 62, height 32 mm.

Aligena pustulosa Dall, var. *choptankensis*, n. var.,

Plate 3, Fig. 1

Aligena pustulosa Glenn, Maryland Geol. Surv., p. 334 (not description, nor figure); not of Dall, 1898.

Shell in shape like *A. pustulosa* Dall, but somewhat wider and of a general larger size; surface posterior to the carina with

strong, numerous, subequal, concentric lamellose lines ; on this area, the pustules are lacking or if present very small and inconspicuous ; anteriorly the concentric sculpture is less strong and quite irregular ; a radial sculpture is present, consisting of raised irregular striæ which may break up into numerous, small, nearly continuous pustules on approaching the basal margin ; other characters similiar to the type form.

Height. 7.5, width 8 mm.

Four specimens of this shell from Jones Wharf, Maryland, all show the above characters, differenting them from the typical *A. pustulosa* Dall. In their shape, strong carina and in other general features, the shells agree with their Oligocene precursor.

Choptank formation ; Jones Wharf, Md.

***Lithophaga pectinicola*, n. sp.,**

• Palte 3, Fig. 2

Shell elongate, subcylindrical, thin and fragile ; with the dorsal and ventral sides straight, and nearly parallel ; beak nearly terminal ; anterior end well rounded, posterior produced and obtusely pointed ; external surface smooth with the growth lines faint ; the surface is in addition quite strongly marked with regular resting stages, most evident on the posterior slope.

Length 12, height 4 mm.

The type specimen was found in a large *Pecten* shell from Yorktown, Va. It is a typical *Lithophaga* and may be distinguished by its cylindric and elongate shape, with ventral and dorsal sides nearly parallel. The posterior extremity is produced.

Yorktown formation ; Yorktown, Va.

CHANGE OF NAMES

Drillia emmonsii, new name, proposed for *Pleurotoma tuberculata* Emmons 1858, Rept. N. C. Geol. Survey., p. 265, fig. 147., preoccupied by *Pleurotoma tuberculata* Pusch, 1837, Pol. Paleont. p. 143, tav. 12, fig. 2a, b.

Drillia cornelliana, new name, proposed for *Pleurotoma elegans* Emmons 1853, Rept. N. C. Geol. Survey, p. 265, fig. 146., preoccupied by *Pleurotoma elegans* Defrance 1826, Dict. des sci. nat. 41, p. 395., also by Sacchi, 1836, Nat. Conch. foss. Gravi-na., p. 43, tav. 1, fig. 8.

EXPLANATION OF
PLATE I (24)

	Page
Fig. 1. <i>Nassa gastrophila</i> , n. sp., Ventral view of the type specimen enlarged about $1\frac{1}{2}$ times.	12 (132)
2. <i>Nassa smithiana</i> , n. sp., Dorsal view, enlarged $2\frac{1}{2}$ times.	12 (132)
3. <i>Drillia ecphoræ</i> , n. sp., Ventral view, enlarged about $2\frac{2}{3}$ times.	
4. <i>Mitromorpha smithfieldensis</i> , n. sp., Type specimen enlarged 6 times.	9 (129)
5. <i>Scala lineata</i> var. <i>magnoliana</i> , n. var., Ventral view of type enlarged about 3 times.	16 (136)
6. <i>Drillia smithfieldensis</i> , n. sp., Type specimen from Smithfield, enlarged 2.7 times.	7 (127)
7. <i>Cerithiopsis</i> (<i>Heterocerithiopsis</i>) <i>smithfieldensis</i> , n. sp., Type specimen enlarged about 6 times.	16 (136)
8. <i>Drillia belloides</i> , n. sp., Specimen from Smithfield, enlarged 3 times.	6 (126)
9. <i>Scala sheldoni</i> , n. sp., Type specimen, enlarged about 6 times.	15 (135)
10. <i>Drillia magnoliana</i> , n. sp., Ventral view of type, enlarged $2\frac{1}{2}$ times.	8 (128)
11. <i>Drillia magnoliana</i> , n. sp., Dorsal view of a larger specimen, enlarged 2 times.	8 (128)
12. <i>Drillia gastrophila</i> , n. sp., Type specimen, enlarged about 3 times.	5 (125)
13. <i>Drillia mcgrawensis</i> , n. sp., Ventral view of type, enlarged about 4 times.	8 (128)
14. <i>Scala dupliniana</i> , n. sp., Ventral view of type, enlarged about 5 times.	15 (135)
15. <i>Scala sheldoni</i> , n. sp., A smaller specimen, enlarged 6 times	15 (135)
16. <i>Drillia gastrophila</i> , n. sp., A small specimen showing the strong carina bordering the suture.	5 (125)

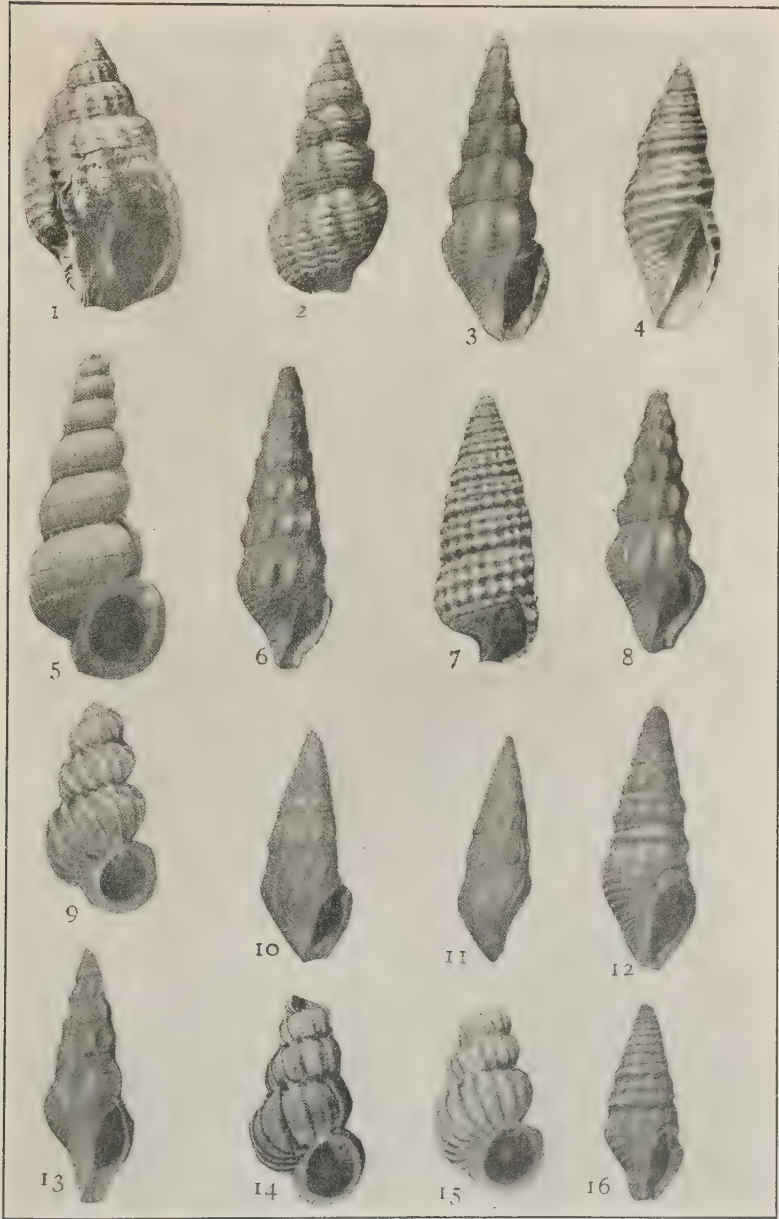
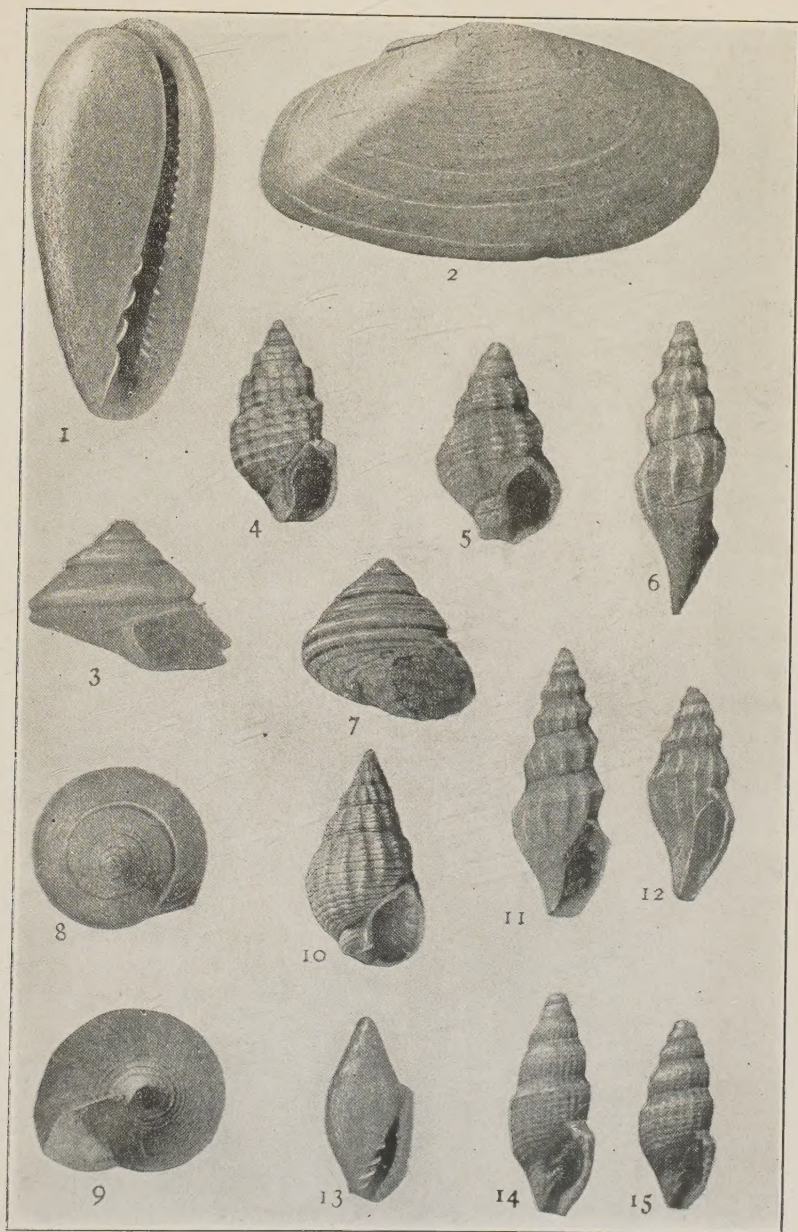


Plate 2 (25)

EXPLANATION OF

PLATE 2 (25)

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| Fig. 1. | <i>Marginella taylori</i> , n. sp., | 9 (129) |
| | Ventral view of type, slightly enlarged. | |
| 2. | <i>Psammobia gubernatoria dalli</i> , n. var., | 25 (145) |
| | Exterior view of right valve of type, natural size. | |
| 3. | <i>Calliostoma shaklefordense</i> , n. sp., | 20 (140) |
| | Ventral view of type, enlarged about 3 times. | |
| 4. | <i>Nassa shaklefordensis</i> , n. sp., | 14 (134) |
| | Ventral view of type, enlarged about 4½ times. | |
| 5. | <i>Nassa alumensis</i> , n. sp., | 13 (133) |
| | Type, enlarged about 4 times. | |
| 6. | <i>Mangilia emissaria</i> , n. sp., | 4 (124) |
| | Ventral view of type, enlarged about 4 times. | |
| 7. | <i>Calliostoma harrisianum</i> , n. sp., | 19 (139) |
| | Type specimen from Kingsmill, Va, enlarged about 3 times. | |
| 8. | <i>Calliostoma suffolkense</i> , n. sp., | 19 (139) |
| | Upper view, enlarged about 2½ times. | |
| 9. | <i>Calliostoma suffolkense</i> , n. sp., | 19 (139) |
| | Lower view, enlarged about 2½ times. | |
| 10. | <i>Nassa consensoides</i> , n. sp., | 13 (133) |
| | Type specimen, enlarged about 2½ times. | |
| 11. | <i>Mangilia magnoliana</i> , n. sp., | 4 (124) |
| | Specimen enlarged 4½ times. | |
| 12. | <i>Mangilia smithfieldensis</i> , n. sp., | 5 (125) |
| | Specimen enlarged about 3 times. | |
| 13. | <i>Marginella schmidtii</i> , n. sp., | 10 (130) |
| | Specimen from Natural Well, enlarged 3 times. | |
| 14. | <i>Mitra mauryi</i> , n. sp., | 11 (131) |
| | Type, enlarged 6 times. | |
| 15. | <i>Mitra mauryi</i> , n. sp., | 11 (131) |
| | Ventral view of a smaller specimen. | |



EXPLANATION OF

PLATE 3 (26)

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| Fig. 1. | <i>Aligena pustulosa choptankensis</i> , n. var., | 25 (145) |
| | Specimen enlarged 3 times. | |
| 2. | <i>Lithophaga pectinicola</i> , n. sp., | 26 (146) |
| | Left valve of type, enlarged about 3 times. | |
| 3. | <i>Teinostoma thompsoni</i> , n. sp., | 21 (141) |
| | Upper view, enlarged 12 times. | |
| 4. | <i>Teinostoma thompsoni</i> , n. sp., | 21 (141) |
| | Lower view of same specimen. | |
| 5. | <i>Pseudorotella bushi</i> , n. sp., | 22 (142) |
| | Lower view of a specimen considerably enlarged. | |
| 6. | <i>Pseudorotella bushi</i> , n. sp., | 22 (142) |
| | Upper view of a specimen. | |
| 7. | <i>Triphoris bartschi</i> n. sp., | 17 (137) |
| | Type specimen, enlarged 6 times. | |
| 8. | <i>Triphoris duplinianus</i> , n. sp., | 18 (138) |
| | Specimen enlarged about 6½ times. | |
| 9. | <i>Cyclostremella magnoliana</i> , n. sp., | 24 (144) |
| | Basal view, enlarged about 15 times. | |
| 10. | <i>Cyclostremella magnoliaua</i> , n. sp., | 24 (144) |
| | Upper view of same specimens. | |
| 11. | <i>Ethalia alexanderi</i> , n. sp., | 22 (142) |
| | Upper view, enlarged 10 times. | |
| 12. | <i>Ethalia alexanderi</i> , n. sp., | 22 (142) |
| | Ventral view, enlarged 10 times. | |
| 13. | <i>Ethalia alexanderi</i> , n. sp., | 22 (142) |
| | Basal view. | |
| 14. | <i>Teinostoma miocenicum</i> , n. sp., | 21 (141) |
| | Upper view, enlarged 9 times. | |
| 15. | <i>Teinostoma miocenicum</i> , n. sp., | 21 (141) |
| | Basal view. | |
| 16. | <i>Circulus schmidtii</i> , n. sp., | 18 (138) |
| | Upper view of type, enlarged 12 times. | |
| 17. | <i>Molleria smithfieldensis</i> , n. sp., | 24 (144) |
| | Basal view showing spirals, enlarged 23 times. | |
| 18. | <i>Molleria harrisi</i> , n. sp., | 23 (143) |
| | Ventral view, enlarged 20 times. | |
| 19. | <i>Molleria harrisi</i> , n. sp., | 23 (143) |
| | Basal view showing the spirals and radial lines, 22 times. | |

